

Effects of red pitaya juice supplementation on cardiovascular and hepatic changes in high-carbohydrate, high-fat diet-induced metabolic syndrome rats

ABSTRACT

Background: The fruit of *Hylocereus polyrhizus*, also known as red pitaya, and buah naga in Malay, is one of the tropical fruits of the cactus family, Cactaceae. Red pitaya has been shown to protect aorta from oxidative damage and improve lipid profiles in hypercholesterolemic rats probably due to phytochemicals content including phenolics and flavonoids. The aim of this study was to investigate the changes in cardiac stiffness, hepatic and renal function in high-carbohydrate, high-fat diet-induced obese rats following supplementation of red pitaya juice. **Methods:** Total 48 male Wistar rats were divided into 4 groups: corn-starch group (CS), corn-starch+red pitaya juice group (CRP), high-carbohydrate, high fat group (HCHF) and high-carbohydrate, high fat+red pitaya juice (HRP). The intervention with 5% red pitaya juice was started for 8 weeks after 8 weeks initiation of the diet. Heart function was determined ex vivo with Langendorff hearts while plasma liver enzymes, uric acid and urea were measured using commercial kits. Total fat mass was determined with Dual-energy X-ray absorptiometry (DXA) scan. Glucose uptake was measured with Oral Glucose Tolerance Test (OGTT). Liver and cardiac structures were defined by histology. **Results:** Supplementation of red pitaya juice for 8 weeks increased energy intake and abdominal circumference but no change in body fat and lean mass respectively. Also, there were a trend of uric acid and glucose normalization for HRP as compared to H-fed rats. Red pitaya juice treatment reduced ALP and ALT but caused significant increment in AST. Diastolic stiffness of the heart was reduced after supplementation of red pitaya juice in corn starch fed rats. However, the reduction was not significant in HRP rats in comparison with H rats. **Conclusion:** The present study concluded that red pitaya juice may serve as a complimentary therapy for attenuating some signs of metabolic syndrome.

Keyword: Red pitaya juice; Metabolic syndrome; High-carbohydrate high-fat diet